

Climatological Data for September, 1909. DISTRICT No. 9, COLORADO VALLEY.

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GENERAL SUMMARY.

The seasonal summer rains, which, this year, were remarkably heavy and widespread, ended abruptly at the beginning of the second decade. During their continuance, the weather in September resembled that of the preceding months; there was a great excess of cloudiness, humidity, and rainfall, with low day temperatures and deficient wind movement. After their close, fair weather prevailed, except for local showers on the 24th and 25th, and the amount of sunshine and the diurnal range in temperature were greater. A cool wave, that brought frost to the higher parts of the district, occurred from the 13th to 15th. A second cool spell prevailed from the 22d to 24th, but over the greater part of the district no killing frost occurred during the month.

The mean temperature of the 136 stations reporting was 66.2°, or 0.9° below the normal. In western Wyoming the mean was 52.3°, or 2.1° above the normal; in the southern portions of the district there was a general deficiency. By subdivisions the means and departures were: western Colorado, 55.1°, -0.7°; eastern Utah, 62.9°, -0.1°; western New Mexico, 64.3°, -1.9°; Arizona, 73.5°, -1.1°. The highest monthly mean was 86.6°, at Mohawk Summit, Ariz.; the lowest, 38.2°, at Corona, Colo. The extremes were: 110° at Parker, Ariz., and 7°, at Breckenridge, Colo.

The average precipitation for the 170 stations reporting was 1.47 inches, or 0.33 inch above their normal. By watersheds the means and departures were: Green, 1.80 inches, +0.40 inch; Grand, 1.86 inch, +0.49 inch; San Juan, 2.13 inches, +1.18 inches; Little Colorado, 1.48 inches, +0.30 inch; Gila and its tributaries, 1.09 inches, +0.08 inch; lower Colorado and its tributaries, 1.37 inches, +1.01 inches. The heaviest monthly amount was 4.56 inches at Fort Wingate, N. Mex.; the least, 0.10 inch at Sentinel, Ariz. Many stations in the San Juan Basin and vicinity reported over 1 inch in twenty-four hours, usually on the 4th and 5th.

This heavy rain falling on a remarkably steep and rocky watershed, caused violent floods in the San Juan and San Miguel rivers and their tributaries. Bridges were carried away, railroad tracks buried under earthslides, growing crops were destroyed and, in places, fields were swept bare and orchards were carried away by the erosive action of the flood. In the San Juan, the water reached the highest stage since settlement of the region, and it is said that the Indians have no tradition of so great a flood. In Arizona the rainfall was not generally beyond the carrying capacity of the streams, and the previously good water supply was augmented. Without further replenishment, the water supply was considered sufficient to last until January 10.

The sunshine was generally below, and the humidity above the normal, on account of the cloudy and wet weather of the first two weeks. Both elements were near the average in the latter part of the month. The wind movement was light, especially in Arizona; this condition has obtained throughout the summer, and is generally found in very wet seasons.

NOTES.

OPENING OF GUNNISON TUNNEL.

The formal opening of Gunnison Tunnel was celebrated at the west portal of the tunnel September 23, with the President of the United States, the Secretary of the Interior, and officials of the Reclamation Service in attendance, and in the presence of many excursionists from all parts of Colorado. A program planned by a committee of local citizens, known as the Gunnison Tunnel Opening Committee, was satisfactorily carried out.

Gunnison Tunnel has a length of a little less than 6 miles and a cross-section nearly rectangular, about 10½ by 12 feet. When completed it will have a capacity of 1,300 second-feet of water, and its purpose is to convey

water from Gunnison River to the valley of the Uncompahgre River for use in irrigation.

The construction of the tunnel was begun in January, 1905, and the actual opening through the tunnel was completed July 6, 1909. For a portion of its length additional excavation will still be required to complete the full section, and a considerable amount of concrete lining is yet to be placed.—*Reclamation Record, October, 1909.*

The Roosevelt Dam, located 75 miles east of Phoenix, Ariz., on the Salt River, at the junction of Tonto Creek will be completed about July 1, 1910. L. C. Hill, Supervising Engineer of the Salt River Project, Phoenix, Ariz., states that the waters of Lake Roosevelt are already 2 miles wide and 10 miles long; and that, when the dam is finished, the water impounded in the lake will be 5 miles wide and 25 miles long, a volume sufficient to irrigate 350,000 acres of land in the lower Salt River Valley, for two years, without replenishment from additional precipitation, run-off, or other source of water supply.

The Reclamation Service has abandoned the San Carlos Project, on the Gila River, in southern Gila County, and recommended the boring of artesian wells for irrigation purposes.

The Laguna Dam, on the Colorado River, located 12 miles north of Yuma, Ariz., has recently been completed. This project is capable of serving water sufficient for the irrigation of some 200,000 acres of land lying along the Colorado River, on the borders of Arizona and California, which will open be for entry during October, 1909.

The Director of the Coconino Forest Experiment Station, Mr. G. A. Pearson, whose headquarters are at Flagstaff, Ariz., has been experimenting with wild grasses with a view to planting hardy grasses for range stock.

The date crop in the Salt River Valley is unusually large this year, and unless heavy rains fall in October, a full crop will be gathered. Lemons ripened during the first week in September, one month earlier than in the preceding year. The gathering of the almond crop ended early in September. It was the largest crop ever grown in the Salt River Valley. The orange crop promises a large yield.

The experiments made in the planting of Egyptian cotton in the lower Colorado and the Salt River valleys, by the Department of Agriculture, during the spring of 1909, have given good results. Picking is still in progress at Buckeye, Phoenix, Sacaton, and Yuma, Ariz.

FLOOD ON THE SAN JUAN RIVER SEPTEMBER, 1909

By W. B. FREEMAN, District Engineer, Geological Survey.

On September 5 and 6, 1909, a very heavy flood took place on the San Juan River and tributaries in southwestern Colorado and northwestern New Mexico. It is stated by the oldest residents in the vicinity of Aztec and Farmington that both the Animas and San Juan rivers reached higher stages during this flood than at any time since the country has been settled; and there was even a statement to the effect that the Indians had no memory of a time when the San Juan was so high.

The high water was caused by heavy and continuous rains at the headwaters and all along the courses of these streams. The upper San Juan itself and all its tributaries from the Piedra westward to and beyond the La Plata, from the north, were simultaneously in flood with the Canyon Largo and other large perennial tributaries from the south, all of which are capable of carrying enormous quantities of water. The Canyon Largo, for instance, has a main water course upwards of 70 miles long, and tributaries 40 or 50 miles long, so that it drains a very large area which at times is subject to an excessive run-off.

The effect of the combined flow of these streams can readily be imagined, and there was the usual resultant damage. In